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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Michael J. Dixon

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EXAMINER

LIANG, LEONARD S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/875,619

Applicant(s)

DIXON ET AL.

Examiner

Leonard S Liang

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,35-37 and 65-67 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,35-37 and 65-67 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification and Drawings

The lengthy specification and drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification and drawings. Specifically, the applicant is required to match all references in the specification with references in the figures.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 35-37, and 65-66 are rejected under 35 U.S.C. 102(b) as being anticipated by Rezanka (US Pat 5818485).

Rezanka discloses:

- {claim 1} Droplet deposition apparatus (figure 1); an array of fluid chambers (figure 1-2, reference 16), each chamber communicating with an orifice for droplet ejection, a common fluid inlet manifold (figure 1-2, reference 18; top) and a common fluid outlet manifold (figure 1-2, reference 18; bottom); each chamber so connected with the inlet manifold and the outlet manifold as to enable a fluid flow from the inlet manifold, through each chamber in the array and into the outlet manifold, the fluid flow through each chamber being sufficient to prevent foreign bodies in the fluid from lodging in the orifice (figure 1-2; abstract; column 1, line 35-column 2, line 38; column 3, lines 15-40); each chamber being associated with means for effecting droplet ejection from the orifice simultaneously with the fluid flow through the chamber (abstract; continuously re-circulating ink); wherein the resistance to flow of the inlet and

Art Unit: 2853

outlet manifolds is chosen such that a negative static pressure at the orifice of any chamber in the array due to the flow varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array (abstract; column 1, line 35-column 2, line 38; column 3, line 54-column 4, line 18)

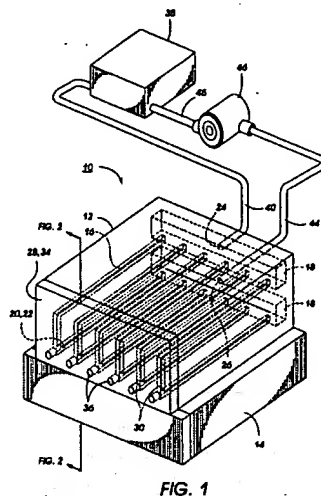


FIG. 1

- {claim 2} wherein the inlet manifold has a resistance to flow less than that which would give rise to a variation in static pressure between the inlets to any two chambers in the array sufficient to produce significant differences in droplet ejection properties between the two chambers in the array (abstract; column 1, line 35-column 2, line 38; column 3, line 54-column 4, line 18)

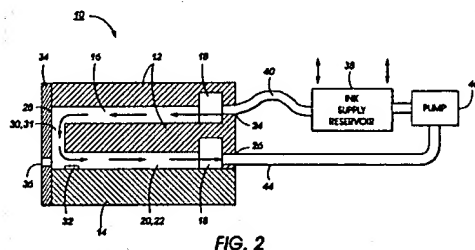


FIG. 2

- {claim 3} wherein the resistance to flow of the outlet manifold is chosen such that the pressure at a fluid inlet to any chamber in the array varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array

(abstract; column 1, line 35-column 2, line 38; column 3, line 54-column 4, line 18)

- {claim 4} Droplet deposition apparatus (figure 1); an array of fluid chambers, each chamber communicating with an orifice for droplet ejection, a common fluid inlet manifold and a common fluid outlet manifold (figure 1-2, reference 16, 18); each chamber so connected with the inlet manifold and the outlet manifold as to enable a fluid flow from the inlet manifold, through each chamber in the array and into the outlet manifold, the fluid flow through each chamber being simultaneous with droplet ejection from the orifice and being sufficient to prevent foreign bodies in the fluid from lodging in the orifice (figure 1-2; abstract; column 1-2; column 3, lines 15-40); the resistance to flow of one of the inlet and outlet manifolds being chosen such that the pressure at a fluid inlet to any chamber in the array varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array (abstract; column 1-2; column 3, line 54-column 4, line 18)
- {claims 5 and 35} wherein the cross-sectional area of at least one of the inlet and outlet manifolds is such that the pressure varies between any two chambers by an amount less than that which would give rise to significant differences in droplet ejection properties between the two chambers in the array (abstract; column 1, line 35-column 2, line 38; column 3, line 54-column 4, line 18)
- {claims 6 and 36} wherein the array of chambers is linear
- {claim 7 and 37} wherein the array is angled to the horizontal and the inlet manifold extends parallel to the array, the properties of the inlet manifold varying in a direction lying parallel to the array in such a way as to substantially match the rate of pressure loss along the inlet manifold due to viscous losses in the inlet manifold to the rate of increase of static pressure along the inlet manifold due to gravity (figure 1, reference 18; abstract; column 1, line 35-column 2, line 38; column 3, line 54-column 4, line 18)

- {claim 65} A method of droplet deposition utilizing apparatus comprising an array of fluid chambers, each chamber communicating with an orifice to define a fluid meniscus in the orifice for droplet ejection, a common fluid inlet manifold and a common outlet manifold, each chamber being associated with means for effecting droplet ejection from the orifice, the method comprising the step of generating a fluid flow into the inlet manifold, through each chamber in the array and into the outlet manifold whereby (figure 1-2); the fluid flow into each chamber is sufficiently greater than the maximum fluid flow of droplets deposited through the orifice that any foreign body in the fluid in the chamber which would inhibit droplet ejection if it entered the orifice, is by virtue of the flow through the chamber more likely to flow past the orifice than to enter into it (abstract; column 1, line 35-column 2, line 38; column 3, line 54-column 4, line 18); a negative static pressure is maintained at each orifice when droplet ejection is not being effected (abstract); the resistance to fluid flow in the inlet and outlet manifolds is sufficiently small that the position of the meniscus in each orifice when droplet ejection is not being effected does not differ across the array (abstract; column 1-2; column 3, line 54-column 4, line 18)
- {claim 66} wherein the flow into each chamber is sufficiently greater than the maximum fluid flow of droplets deposited through the orifice of the chamber that the fluid flow rate through each chamber remains substantially constant (figure 1; column 1-2; column 3, line 54-column 4, line 18)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2853

Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rezanka (US Pat 5818485).

Rezanka discloses a method (as applied to claim 65 above).

Rezanka differs from the claimed invention in that it does not explicitly disclose that wherein the flow into each chamber is ten times greater than the maximum fluid flow of droplets deposited through the orifice of the chamber.

Rezanka discloses “Ultimately, the loading capability of the ink meniscus will determine the maximum flow which can be supported in the open channel. The maximum flow which a channel with wall surface wettable by the fluid can support without overflowing out of the channel is one whereby at the entrance the pressure in the fluid is equal to the atmospheric pressure—at higher pressure the fluid will spill out of the channel, while at the exit, the pressure in the fluid is the lowest negative gauge pressure the meniscus can support.” While Rezanka does not explicitly state that the flow into each chamber is ten times greater than the maximum fluid flow of droplets deposited through the orifice of the chamber, it is implied depending on the dimensions of the channel width and atmospheric pressure. It should be clear from the disclosure of Rezanka however that the flow into each chamber is greater than the maximum fluid flow of droplets deposited through the orifice of the chamber. If this was not the case, the disclosed motivation or preventing ink thickening and drying could not properly occur (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Rezanka, so that the flow into each chamber is ten times greater than the maximum fluid flow of droplets deposited through the orifice of the chamber. The motivation for the skilled artisan in doing so is to gain the benefit of preventing ink thickening or drying out of the ink at the nozzles.

Response to Arguments

Applicant's arguments with respect to claims 1-7, 35-37, and 65-67 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Art Unit: 2853

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S Liang whose telephone number is (571) 272-2148. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

lsl


LAMSON NGUYEN
PRIMARY EXAMINER
01/29/08